EPSON

EPSON EUROPE ELECTRONICS

ED Newsletter 2000 | Vol. 1

EPSON's Multi-Output Programmable Crystal Oscillator

In response to the market demand for higher integration, EPSON has released the multiple output crystal oscillator MG-5100SA series that can provide up to six different clock frequencies at different outputs of one single IC.

The MG-5100SA series is a programmable crystal oscillator with three built-in PLLs. Most frequencies from 76.9 kHz to 100 MHz (at 5.0 V) can be obtained by independently programming the parameters for the built-in PLL circuits into the component's EPROM.

By selecting additional divider ratios with the setting of three input terminals, up to 32 different frequency settings for the output terminals can be selected. This feature is effectively extending the fixed programming of the three internal PLLs.

The MG-5100SA series contributes to designing more compact devices while also shortening the design cycles. It can be used for systems that require multiple clocks and for systems that require frequency shifting e.g. car navigation systems and set top boxes.

● Specifications

|	
Output frequency range	76.9 kHz to 80 MHz (3.3 V)
	76.9 kHz to 100 MHz (5.0 V)
Number of output terminals	6 (including reference clock)
Reference clock output	1 (17.734 or 28.63636 MHz)
Frequency stability	±100, ±50 ppm (−20 to 70 °C)
Operating voltage	3.3 V or 5.0 V
Package	SOP-14 pin
External dimensions	10.1 x 7.4 x 3.2 (mm)

Ultra-thin Crystal Unit from EPSON

With the FA-238 EPSON achieved more than just coping with the trend of continuous miniaturization in the area of mobile telecommunication and portable data processing. A mere height of 0.7 mm sets a new landmark in the dimensions of crystal units. The FA-238 is an AT-cut crystal that can currently be provided in frequencies between 20 and 50 MHz. The frequency tolerance lies at ±50ppm at a standard load capacity of 12 pF. High reliability and accuracy are basic features of every EPSON quartz device. It comes in an SMD ceramic package with external dimensions of 3.2 x 2.5 x 0.7 mm. This makes it suitable for even extremely small applications and will be appreciated by Design Engineers of PDA, cellular handsets or bluetooth related products: EPSON delivered another proof for its leadership in the development of miniature devices.
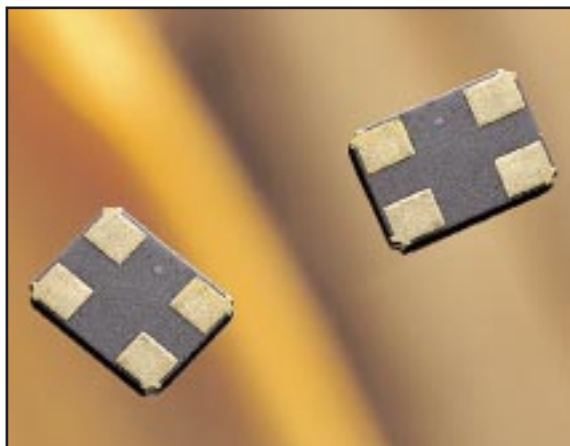
● Specifications

Nominal frequency range	20 to 50 MHz
Frequency tolerance	±50ppm (Ta=25 °C)
Temperature characteristics	±30ppm (-20 to 70°C)
Equivalent series resistance	100 (max./ 20 to 30 MHz)
	60 (max./ 30 to 50 MHz)
Load capacity	12 pF
External dimensions	3.2 x 2.5 x 0.7 mm

System-on-QD – RTC Module with built in Temperature Sensor

EPSON has added a new member to the RTC product family with serial interface. In contrast with other manufacturers we build RTCs (Real Time Clock) with all the required components integrated in a single package. Besides the LSI, the crystal oscillator itself is combined with the component as well. In the currently released RTC-4701JE a temperature sensor has been additionally integrated.

In addition to the usual timer functions it is capable of providing temperature data - a feature needed e.g. in smart battery protection circuits. An extremely low current consumption of 0.5 mA makes it ideal for portable, battery powered products. The SMD package has external dimensions of 7.3 x 6.2 x 1.5 mm. Through a simple three-wire serial interface the RTC communicates with its environment.

The integration of usually discreet parts is a result of the space saving efforts of EPSON. This strategy leads to the development of the unique System-on-QD (Quartz Device), as presented by the RTC-4701JE.

Specifications

R T C	Operating voltage	1.6 V to 5.5 V
	Operating temperature range	−40 to +85 °C
	Frequency tolerance	5 ±23 ppm (25 °C, 3.0 V)
	Current consumption	0.5 µA (Typ./3 V)
S e n s o r	Output voltage	1.48 V (Typ./25 °C)
	Temperature sensitivity	−7.5 mV/°C (Typ. /−20 to 60 °C)
	Output resistance	1.0 kΩ (Typ./25 °C)
External dimensions		7.3 x 6.2 x 1.5 mm (max.)

## EPSON's Embedded Memory LCD Controller   SED1375

The SED1375 is a color/monochrome LCD graphics controller with an embedded 80 kByte SRAM display buffer. The high integration of the SED1375 provides a low cost, low power, single chip solution to meet with the requirements of embedded markets such as office automation equipment, mobile communications devices and Palm size PCs where boards size and battery life are major concerns.

Products requiring a "Portrait" display can take advantage of the Hardware Portrait mode feature of the SED1375. Virtual and Split Screen are just some of the display modes supported. While focusing on devices by the Microsoft Windows® CE Operating System, the SED1375's impartiality to CPU type or operating system makes it an ideal display solution for a wide variety of applications.

Features

■ Embedded 80 kByte SRAM display buffer
■ Direct support of the following CPUs: Hitachi SH-3, Hitachi SH-4, Motorola M68xxx
  MPU bus interface with programmable READY
■ Resolutions up to 640x480 at color depth of 2 bpp.
  640x240 at color depth of 4 bpp.
  320x240 at color depth of 8 bpp.
■ Up to 256 simultaneous colors from a possible 4096 colors on passive LCD panels and active matrix TFT/d-TFD LCD panels
■ Register level support for EL panels
■ Hardware Portrait mode
■ Split Screen Display
■ Virtual Display Support
■ LCD power-down sequencing
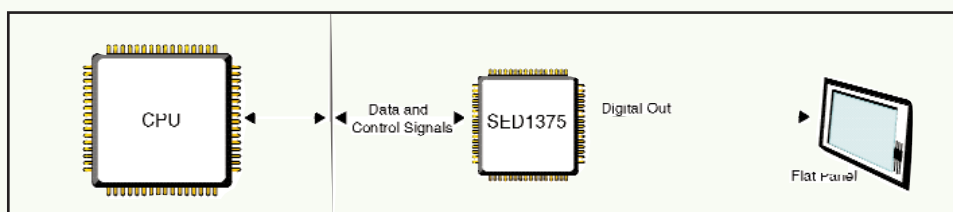
EPSON ASMIC based on C33 core: E0C33208

The E0C33208 is a CMOS 32 bit microprocessor composed of a 32-bit RISC core, 8 Kbyte RAM, DMA, timers, SIO, ADC (10 bit, successive approximation type), PLL and other peripherals. This microprocessor was improved to operate at high speed and with ultra low power consumption. One of the main features that make this microprocessor unique is the capability to perform a MAC operation in only 2 clock cycles. This feature approaches the EOC33208 to DSP operations, making it suitable for voice applications, PDAs, Toys and OA products such as printers. The EOC33208 is shipped in a QFP5-128 package. The core operates from 1.8 to 3.6 V and the I/O terminal can handle 1.8 to 5.5 V.

Additionally EPSON can supply firmware for Sound Compressing, JPEG Image Compressing, Text-to-Speech, Voice Compression and Decompression, Voice Recognition and Realtime Operating Systems. The voice recognition firmware is based on two types of recognition algorithms: speaker independent recognition and speaker dependent recognition. The engine is able to recognise 20 to 100 words in real time depending on the conditions during the learning phase. EPSON provides PC tools for the development of the data used for the voice recognition algorithm.

Suppliable Firmware

- Sound compressing (MELODY33, SOUND33)
- JPEG image compressing (JPEG33)
- Text-to-speech
- Voice compression and decompression (VOX33)
- Voice recognition (VRE33)
- Realtime operating system (ROS33)

Applications

- Voice applications
- PDAs
- Toys
- OA products e.g. printers

Specifications

Supply Voltage	2.0 +/- 0.2 V; 3.3 +/- 0.3 V; 5.0 +/- 0.5 V
Clock Frequency	20 MHz / 60 MHz High Speed 32.768 kHz Low Speed
Memory RAM	8 kByte
I/O ports	13 Input; 29 Input/Output
Power Consumption	HALT state: 27µA (3.3 V, 32.768 kHz) RUN state: 65mA (3.3 V, 20 MHz)
Serial interface	2 ch synchronous, asynchronous selectable (IrDA)
Timers	8 bit x 4; 16 bit x 6; Watch-dog
A/D Converters	10 bit x 8
Interrupts	10 (external); 29 (internal)

Super High Speed, High Integration Gate Arrays and Embedded Arrays – SLA60000 Series / SSL60000 Series-

EPSON goes ahead with Gate Array products, now launching the SLA60000 series based on a 0.25 µm technology with 3 and 4 interconnection metal layers. This new series is composed of a total of 20 different arrays ranging from 99 K up to 2,588K basic cells. The main highlights of this new series are: high speed, high integration and low power consumption.

EPSON will continue the policy of penetrating the European market, offering additional commercial advantages for all Gate Array products: low volume support of business (starting from 5000 pieces per year), improved turn around times for test sample production, reduced unit price, low NRE costs, etc. Moreover this technology can also be applied to the SSL60000 series, combining embedded macrocells (ARM7TDMI, ADC, DAC, etc.) with Gate Arrays, so the commercial advantage can be kept for embedded arrays as well.

Features

Leading edge process used	0.25 µm CMOS silicon gates, 3/4 layer metal
High speed operation	Internal gate delay 107 ps at 2.5 V
High integration	up to 2,520,000 gates built in
Low power consumption	0.18 µW/BC/MHz at 2.5 V
Low voltage operation	2.5 V / 2.0 V
Level shifter built in	3.3 V signal input/output possible
Multiple specification packages	48 to 304 pin QFP, 255 to 480 pin BGA, PFBGA, CFLGA, etc.
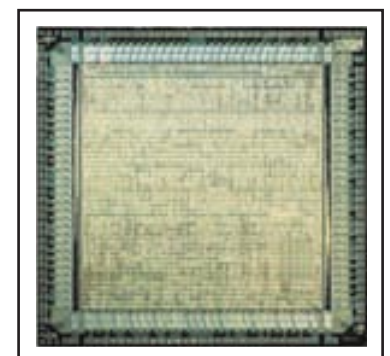
● EPSON opens new Design Center in Scotland

The semiconductor market has entered into so called "System-On-Chip" generation and the market requirements to semiconductor vendors have highly diversified. This development coming along with the opportunity to find well-experienced and well-educated engineers on the one hand and the believe that the origin of most important voice and audio signal processing architectures is in Europe, concluded in the decision of EPSON to establish a design centre in Europe in order to meet such diversified market requirements.

Up to these days EPSON has only provided hardware to most of the LSI customers and due to the low-voltage, low-power technology of both logic and analogue circuitry the building up of the new EPSON Design Centre became necessary in order to be able to adjust to the needs of the mobile information terminal market such as mobile phones, portable audio equipment and portable multimedia equipment. The market requirements to semiconductor vendors have become not only provision of LSI hardware but also provision and technical support of firmware.
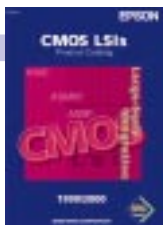
The new EPSON Design Centre will develop the firmware and give support to the customers as well. In its beginning, the firmware will target base-band chips of mobile phone and control chips of portable audio equipment, and it will expand to possible portable or wearable multimedia products.

The Design Centre will be based at the Alba Centre in Livingston, Scotland and will open its doors in the beginning of December 1999. It is planned to employ up to 15 research and design engineers within two years at the 140 m² unit at Alba`s Design Centre. The Scotland Design Centre will be a branch of EPSON EUROPE ELECTRONICS in Munich, which is the European Headquarter for Electronic Devices of the japanese company EPSON.

General Manager of the Scotland Design Centre will be Mr. Mitsuharu Kodaira.